

REMARKS

Claims 14-19 and 28-30 stand rejected under 35 U.S.C. § 112, second paragraph; and § 102(b)/103(a). With this response, claims 1-13, 15, 20-31 have been canceled, claims 14, 16, 18, and 19, have been amended, and claims 32-38 have been added. Reconsideration of the claims as pending is respectfully requested.

I. Applicant's invention.

The invention is directed to a coated article having a lubricious hydrophilic coating. The hydrophilic coating is made up of a three-dimensional supporting acrylic polymer matrix formed through crosslinking bridges at functional moieties on the polymer. The coating additionally includes a hydrophilic polymer associated with the supporting acrylic polymer. When in contact with an aqueous medium, the hydrophilic polymer hydrates and becomes lubricious. The coating relies upon physical entanglement or other favorable associative interactions to retain the hydrophilic polymer within the three-dimensional network. Proper selection of the crosslink density provides the desired durability (slip retention) without compromising the ability of the hydrophilic polymer to hydrate and become slippery. The acrylic polymer has an equivalent weight of functional moiety in the range of about 200 to 1000g/eq.

The invention addresses the problem of how to provide a slippery, yet durable, coating, *i.e.*, one that does not wear or wash off while in use in an aqueous medium. In order to provide a lubricious coating, the hydrophilic polymer of the coating needs a certain degree of mobility in order to solvate and to interact with the aqueous solution. That same mobility leads to the loss of the hydrophilic polymer from the coating and a loss of slipperiness (poor slip retention). After a short time in water, the hydrophilic component of the coating is washed away due to its

preferential interaction with the aqueous environment. The present invention provides a crosslinked supporting polymer having sufficient crosslink density to retain the hydrophilic polymer during exposure to aqueous environment, without destroying slip.

II. Rejection of claims 14-19 and 28-30 under 35 U.S.C. § 112, second paragraph.

Claims 14-19 and 28-30 stand rejected under 35 U.S.C. 112, second paragraph as being indefinite for failing to point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1-13, 15, and 20-31 have been canceled. Claims 14, 16, 18 and 19 have been amended and claims 32-38 have been added so as to point out and distinctly claim the subject matter which is the invention of the Applicant.

Claim 14 has been amended to recite "said acrylic polymer having an equivalent weight of functional moiety in the range of 200 to 1000 g/eq. and forming a three-dimensional network through crosslinking bridges at said functional moiety". This description of acrylic polymer finds support at page 4, lines 14-16, page 5, line 10, page 8, line 16, page 17, lines 5-14. Language objected to in the Office Action has been deleted, thereby obviating the rejection of claim 14 under 35 U.S.C. § 112, second paragraph. Furthermore, claim 14 now provides proper antecedent basis for "crosslink density" as is recited in claim 17.

Claims 15 and 28-30 have been canceled, now rendering the rejection moot.

Claim 16 has been amended by deleting the words "methyl cellulose" and "poly(vinyl pyrrolidone)" and inserting clarifying commas in order to obviate the rejection by the Examiner under 35 U.S.C. § 112, second paragraph.

Claim 18 has been amended to recite moieties derived from aziridines, carbodiimides, epoxides, unsaturated carbon-carbon and carbon-heteroatom bonds, ionic Zn, Ca, and Mg, and melamine and urea/formaldehyde condensates. Support for Zn, Ca, and Mg is found at page 11, lines 11-12. Support for melamine and urea/formaldehyde condensates is found at page 11, line 8. This amendment is made in order to clearly define the subject matter as it relates to “unsaturated carbon and hetero bonds, ionic agents and the ‘/’”.

Claim 19 has been amended by deleting the words “such as boat hulls” and “water-contacting items” so as to obviate the Examiner’s rejection under 35 U.S.C. § 112, second paragraph, indefinite subject matter as per the metes and bounds.

³¹
Claim ~~32~~ has been added and finds support at page 12, line 27.

³²
Claim ~~33~~ has been added and finds support at page 4, line 13.

³³
Claim ~~34~~ has been added and finds support at page 4, line 14 and page 10, line 12.

³⁴
Claim ~~35~~ has been added and finds support at page 10, line 25.

³⁵
Claim ~~36~~ has been added and finds support at page 10, line 27.

³⁶
Claim ~~37~~ has been added and finds support at page 4, line 26-30.

It is submitted that these amendments are fully supported by the specification and do not incorporate new matter. Furthermore, it is submitted that the amended claims satisfy the requirements of 35 U.S.C. § 112, second paragraph. The rejection may now be withdrawn.

III. Rejection of claims 14-19 and 28-30 Under the Judicially created Doctrine of Obviousness-Type Double Patenting.

The Examiner is of the opinion that the above listed claims are unpatentable over claims 1-14 of Opolski (U.S. Patent No. 6,238,799 B1). The Examiner admits that the claims are not identical and alleges that they are not patentably distinct from each other “because the instantly claimed invention generally encompasses the claimed invention of U.S. Patent No. 6,238,799 B1.” The Applicant will consider the appropriateness of filing a terminal disclaimer with respect to U.S. Serial No. 09/855,923 in compliance with 37 CFR 1.321(c) upon identification of allowable subject matter.

IV. Rejection of claims 14-19 and 28-30 under 35 U.S.C. § 102(b)/103(a).

Renumbered claims 14-19 and 28-30 stand rejected under 35 U.S.C. § 102(b) as anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as obvious over, Opolski (U.S. Patent No. 5,272,012 (the “Opolski patent”)). The Office Action considers that Opolski discloses all the elements of the claimed invention, “with the understanding that one of ordinary skill in the art would have readily envisaged the use of a lactam such as polyvinyl pyrrolidone in lieu of or in addition to the Dimethyl Siloxane...” (page 7, ¶10, of the Office Action dated 12/20/2002). Applicant respectfully traverses the rejection as it applies to the currently amended claims.

Opolski discloses a protective coating including a “protective compound” for toughness and protection of the underlying article (col. 2, lines 12-23) and a “slip additive” for slipperiness (col. 2, lines 40-57). Slip additives may be hydrophobic polymers which self-associate into distinct, discontinuous domains within the protective polymer. These hydrophobic polymers

migrate to the surface and confer slip to the coating. Slip additives such as hydrophilic copolymers can also be used but must crosslinked to the protective polymer or to the underlying article (col. 2, lines 45-48). This crosslinking of the hydrophilic copolymer to the protective polymer or article is essential in order to prevent it from leaching from the protective polymer and thereby causing the coated article to lose slip (see accompanying Declaration from Margaret Opolski).

As is explained by Margaret Opolski in the accompanying Declaration, the Opolski patent teaches the use of a hydrophilic copolymer having reactive groups that react with the protective polymer to covalently link the two. Ms. Opolski explains that only copolymers of poly (N-vinyl lactams) having reactive functional groups are taught because it was considered necessary to covalently attach the slip agent to the protective polymer (see ¶ 5-7 of the Opolski Declaration). In the Opolski patent there is no teaching or suggestion of a hydrophilic polymer entrapped within a supporting polymer by associative interactions of the hydrophilic polymer with the supporting acrylic polymer. Nor is there a teaching or a suggestion of a supporting polymer that is crosslinked with sufficient crosslink density to entrap the hydrophilic polymer *within the matrix without the crosslinking* of the hydrophilic polymer to the supporting polymer. Specifically, there is no teaching or suggestion of an acrylic polymer matrix “having an equivalent weight of functional moiety in the range of about 200 to 1000 g/eq.,” as recited in claim 14. Therefore the Opolski patent neither teaches nor suggests the claimed coating.

For the foregoing reasons, it is submitted that the claimed invention is not anticipated by, or obvious in view of the Opolski patent.

V. CONCLUSION

Applicants submit that the outstanding rejections of the claims have been fully overcome. Accordingly, Applicants respectfully submit that the pending claims, 14,16-19, and 32-38 are now in condition for allowance. If the Examiner believes that any further discussion of this communication would be helpful, she is encouraged to contact the undersigned by telephone.

No additional fees are believed to be due in connection with this Amendment and Response. However, please apply any additional charges, or credit any overpayment, to our Deposit Account No. 08-0219.

Respectfully submitted,

Date: May 20, 2003

Mary Rose Scozzafava
Mary Rose Scozzafava, Ph.D.
Reg. No. 36,268

Hale and Dorr LLP
60 State Street
Boston, MA 02109
Tel: (617) 526-6000
Fax: (617) 526-5000